



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/936,184	09/10/2001	Signe Unverricht	211820US0PCT	9394
22850	7590	12/10/2004	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			OH, TAYLOR V	
			ART UNIT	PAPER NUMBER
			1625	

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/936,184

**Applicant(s)**

UNVERRICHT ET AL.

**Examiner**

Taylor Victor Oh

**Art Unit**

1625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/13/04
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Art Unit: 1625

Applicant's arguments with respect to claims 1-31 have been considered but are moot in view of the new ground(s) of rejection.

### The Status of Claims

Claims 1-31 are pending.

Claims 1-31 have been rejected.

## **DETAILED ACTION**

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-31 rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 6,740,779 B1. Although the conflicting claims are not identical, they are not patentably distinct from

Art Unit: 1625

each other because claims 1-9 of U.S. Patent No. 6,740,779 B1 does disclose the similar invention as shown in the claims 1-31 of the instant invention in the following:

1. A process for the catalytic gas-phase oxidation of propene to acrylic acid, in which a reaction gas starting mixture which comprises propene, molecular oxygen and at least one inert gas and contains the molecular oxygen and the propene in a molar  $O_2 : C_3H_6$  ratio of  $\geq 1$  is passed, in a first reaction stage, using a propene loading of  $\geq 160$  liter (S.T.P.) of propene/liter of fixed catalyst bed 1 per hour, under formation of acrolein and optionally acrylic acid as a byproduct, over a fixed catalyst bed 1 which is arranged in two spatially successive reaction zones A, B, the temperature of the reaction zone A being from 300 to 370° C. and the temperature of the reaction zone B being from 305 to 380° C. and simultaneously at least 5° C. above the temperature of the reaction zone A wherein catalyst bed 1 comprises an active material catalyst bed 1 being at least one multimetal oxide containing at least the elements Mo, Fe and Bi, in such a way that the propene conversion in reaction zone A is from 40 to 80 mol % and the propene conversion during a single pass through the fixed catalyst bed 1 is  $\geq 90$  mol % and the associated selectivity of the acrolein formation and of the acrylic acid byproduct formation together are  $\geq 90$  mol %, and the resulting product gas mixture, which contains the molecular oxygen and the acrolein in a molar  $O_2 : C_3H_4O$  ratio of  $\geq 0.5$ , is passed, in a second reaction stage, over a fixed catalyst bed 2 which is arranged either in a single reaction zone C or in two spatially successive reaction zones D, E, the temperature of the reaction zone C being from 230 to 300° C. and the temperature of the reaction zone D being from 230 to 280° C. and the temperature of the reaction zone E being from 250 to 300° C. and simultaneously at least 5° C. above the temperature of the reaction zone D and the active material of catalyst bed 2 being at least one multimetal oxide containing at least the elements Mo and V, in such a way that the acrolein conversion during a single pass through the reaction zone C or the reaction zones D and E is  $\geq 90$  mol % and the selectivity of the acrylic acid formation balanced over all reaction zones and based on propene converted is  $\geq 80$  mol %, the sequence in which the reaction gas starting mixture flows through the reaction zones corresponding to the alphabetic sequence of the reaction zones, wherein both the fixed catalyst beds 1 and 2 and the reaction zones A, B and C or A, B, D and E are present in a single tube-bundle reactor comprising a plurality of catalyst tubes.

2. A process as claimed in claim 1, wherein the propene conversion in reaction zone A is from 50 to 70 mol %.

3. A process as claimed in claim 1, wherein the propene conversion in reaction zone A is from 65 to 75 mol %.

4. A process as claimed in claim 1, wherein the temperature of the reaction zone B is at least 10° C. above the temperature of the reaction zone A.

5. A process as claimed in claim 1, wherein the propene loading of the fixed catalyst bed 1 is  $\geq 180$  liter (S.T.P.) / 1-hour.

Art Unit: 1625

6. A process as claimed in claim 1, wherein the active material of the fixed catalyst bed is at least one multimetal oxide of the formula I



where

X<sup>1</sup> is at least one of nickel or cobalt,

X<sup>2</sup> is at least one of thallium, an alkali metal or an alkaline earth metal,

X<sup>3</sup> is at least one of zinc, phosphorus, arsenic, boron, antimony, tin, cerium, lead or tungsten,

X<sup>4</sup> is at least one of silicon, aluminum, titanium or zirconium,

a is from 0.5 to 5,

b is from 0.01 to 5,

c is from 0 to 10,

d is from 0 to 2,

e is from 0 to 8,

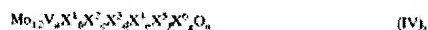
f is from 0 to 10 and

n is a number which is determined by the valency and frequency of the elements other than oxygen in formula I.

7. A process as claimed in claim 1, wherein the temperature of the reaction zone E is at least 20° C. above the temperature of the reaction zone D.

8. A process as claimed in claim 1, wherein the selectivity of the acrylic acid formation, balanced over both reaction stages and based on propene converted is  $\geq 90$  mol %.

9. A process as claimed in claim 1, wherein the active material of the fixed catalyst bed 2 is at least one multimetal oxide of the formula IV



where

X<sup>1</sup> is at least one of W, Nb, Ta, Cr or Ce,

X<sup>2</sup> is at least one of Cu, Ni, Co, Fe, Mn or Zn,

X<sup>3</sup> is at least one of Sb or Bi,

X<sup>4</sup> is one or more alkali metals,

X<sup>5</sup> is one or more alkaline earth metals,

X<sup>6</sup> is at least one of Si, Al, Ti or Zr,

a is from 1 to 6,

b is from 0.2 to 4,

c is from 0.5 to 18,

d is from 0 to 40,

e is from 0 to 2,

f is from 0 to 4,

g is from 0 to 40 and

n is a number which is determined by the valency and frequency of the elements other than oxygen in formula IV.

However, the instant invention differs the prior art in that the instant claims have the at least one inert gas and carbon dioxide and CO, and steam in the reaction gas

Art Unit: 1625

mixture comprises  $\geq 40$  to 60 % by volume of molecular nitrogen ; the inert gas contains  $\text{CO}_2$  and CO; the propene content of the reaction gas is from 4 to 15 % by volume; the first and second reaction stages are carried out in two tube-bundle reactor; the active material of the first fixed-bed catalyst is at least one metal oxide of the

formula  $[\text{Y}^1_{\text{a}}\text{Y}^2_{\text{b}}\text{O}_{\text{x}}]_{\text{p}}[\text{Y}^3_{\text{c}}\text{Y}^4_{\text{d}}\text{Y}^5_{\text{e}}\text{Y}^6_{\text{f}}\text{Y}^7_{\text{g}}\text{Y}^8_{\text{h}}\text{O}_{\text{y}}]_{\text{q}}$  (II)

; the active material of the second fixed-bed catalyst is at least one metal oxide of the formula VI of (D)p(E)q ; the first fixed-bed catalyst comprises annular and /or spherical catalysts; the ring geometry is with the claimed diameter, length, wall thickness; and a coated catalyst comprises a spherical support with the claimed diameter and thickness.

Even so, the specification does describe that the inert gas may contain nitrogen concentration,  $\text{CO}_2$  and or /CO (see col. 4, lines 13-23 ), whereas the propene content of the reaction gas is from 4 to 15 % by volume(see col. 19 ,lines 26 ) and the tube-bundle reactors can be employed in the reaction zones(see col. 14,line 34 ) ; in addition, regarding one metal oxide of the formula VI of (D)p(E)q , and one metal oxide of the formula II (see col.7 ,lines 25-60), the specification indicates the same formula VI of (D)p(E)q (see col. 12 , lines 1-40). Therefore, those limitations are relevant to the claimed invention.

With respect to the first annular and /or spherical fixed-bed catalysts; the ring geometry with the claimed diameter, length, wall thickness; the coated catalyst having a spherical support with the claimed diameter and thickness, the specification does indicate that the first annular and /or spherical fixed-bed catalysts is specified in col. 7 ,lines 4-11; the ring geometry is also specified in col. 11 , lines 21-26; the coated catalyst

Art Unit: 1625

with the claimed diameter and thickness is specified in col. 7 , lines 5-6 and in col. 11,  
38.

Therefore, it would have been obvious to the skillful artisan in the art to be motivated to add those limitations to the claims in such a way to emphasize the certain steps in the process because they are not patentably distinct from each other with respect to the claims of themselves.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cecilia Tsang can be reached on 571-272-0562. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*mp* ✓  
12/7/04

*Cecilia J. Tsang*

Cecilia J. Tsang  
Supervisory Patent Examiner  
Technology Center 1600